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Signed *Andrew George*
Dated 17 November 2000

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11 NOV 1999**RECEIVED BY POST****Request for grant of a patent**

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11NOV99 E490S90-3 D01038
P01/7700 0.00-9926599 The Patent OfficeCardiff Road
Newport
Gwent NP9 1RH

1. Your reference

AJC/P602/44387/JA

2. Patent application number

(The Patent Office will fill in this part)

9926599.33. Full name, address and postcode of the or of each applicant (underline all surnames)

THE KENDALL COMPANY (UK) LIMITED

2 ELMWOOD,
CHINEHAM BUSINESS PARK, BASINGSTOKE,
HAMPSHIRE. RG24 8WG

Patents ADP number (if you know it)

7777196001

If the applicant is a corporate body, give the country/state of its incorporation

UNITED KINGDOM

4. Title of the invention

ANKLE FOOT ORTHOSIS

5. Name of your agent (if you have one)

WITHERS & ROGERS
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LONDON. SE1 2HW
ENGLAND

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Patents ADP number (if you know it)

1776001

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Country

Priority application number

(if you know it)

Date of filing

(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

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YES

- a) any applicant named in part 3 is not an inventor, or
- b) there is an inventor who is not named as an applicant, or
- c) any named applicant is a corporate body.

See note (d)

DUPPLICATE

ANKLE FOOT ORTHOSIS

5 This invention relates to an ankle foot orthosis intended to support the lower leg, ankle and foot. Such an orthosis may be required in order to counteract the effects of muscular and nervous disorders.

Conventional orthoses provide a rather rigid strut or frame which is fixed to the lower
10 leg and foot in order to counter the effect of e.g. muscle spasms therein. When fitted, the patient may be able to walk whereas without an orthosis, walking may be almost impossible.

A traditional orthosis is somewhat bulky, and may require the wearing of special
15 clothing and shoes. An additional and significant disadvantage is that a normal walking gait cannot be obtained due to the inevitable immobilisation of at least part of the ankle joint.

WO-A-9834572 proposes an ankle/foot orthosis having a rigid strut connecting a lower
20 leg support to a sole plate. The strut is generally inflexible, but the sole plate is said to have sufficient flexibility to improve the walking gait by permitting bending of the toes.

According to the present invention there is provided an ankle/foot orthosis comprising a strapping member for a lower leg, and having an inflexible anterior longitudinal
25 stiffener, a sole plate, and a relatively flexible strut connecting the longitudinal stiffener and the sole plate, the strut extending to the sole plate at the outer side thereof, and anterior of the position of the ankle.

Such an orthosis permits a degree of ankle flexibility, which promotes a more normal
30 walking gait.

The stiffener is preferably on the inside of the strapping member, and in a preferred embodiment resides in a channel formed therein. The channel is preferably open at the bottom.

- 5 Other features of the invention will be apparent from the following description of a preferred embodiment, shown by way of example only in the accompany drawings in which:

Figure 1 is a side elevation of the lower leg and foot of a human, to which an orthosis
10 according to the invention has been attached;

Figure 2 is a front elevation of an unattached orthosis corresponding to Figure 1; and

Figure 3 is a graphical representation showing the gait provided by the invention.

15 With reference to the drawings, an orthosis 10 comprises a strapping member 11 of thermoplastic and typically having a thickness of 2.5mm. This member is sufficiently rigid to be self-supporting in a shape conforming approximately to the front and side contours of a human leg 12. The member is also mouldable by the application of heat,
20 for example from a hot air gun, in order to obtain a good fit around a patient's leg. The sides of the supporting member are cut away to improve comfort, leaving four strapping regions which extend further round the leg. On the left side of Figure 2 (as viewed) simple buckles 13 are attached by fabric loops 14 and rivets 15. On the right side, fabric straps 16 having inner end and outer end areas 17, 18 covered with the different
25 components of a suitable hook and loop type of fastener. The straps 16 are also attached by rivets 15.

Moulded within the member 11 is a channel 19 open at the bottom and generally aligned with the shin bone.

30 Closely fitting within the channel 19 is a stiffener 21 of carbon fibre reinforced resin. Typically the stiffener has a width of about 26mm, and a thickness of 3mm.

To attach the orthosis, straps 16 are passed through the buckles 13, and the portions 18 laid over the portions 17 to the required degree of tightness. The straps 16 may finally be trimmed to a reasonable length.

- 5 Figure 3 shows a graphical representation of the gait of a typical wearer of the preferred embodiment. The 'X' axis shows time in seconds, and the 'Y' axis shows percentage of body weight. This gait approximates closely to a normal gait, the first peak indicating a distinct heel strike, and the second peak indicating a distinct toe strike. The forces generated approach those of a normal gait thus giving the user the appearance of
10 walking normally. The overall time for a step at normal walking pace is about the same as for an undischarged person, thus permitting an approximately even walking pace where only one leg of the person requires support.

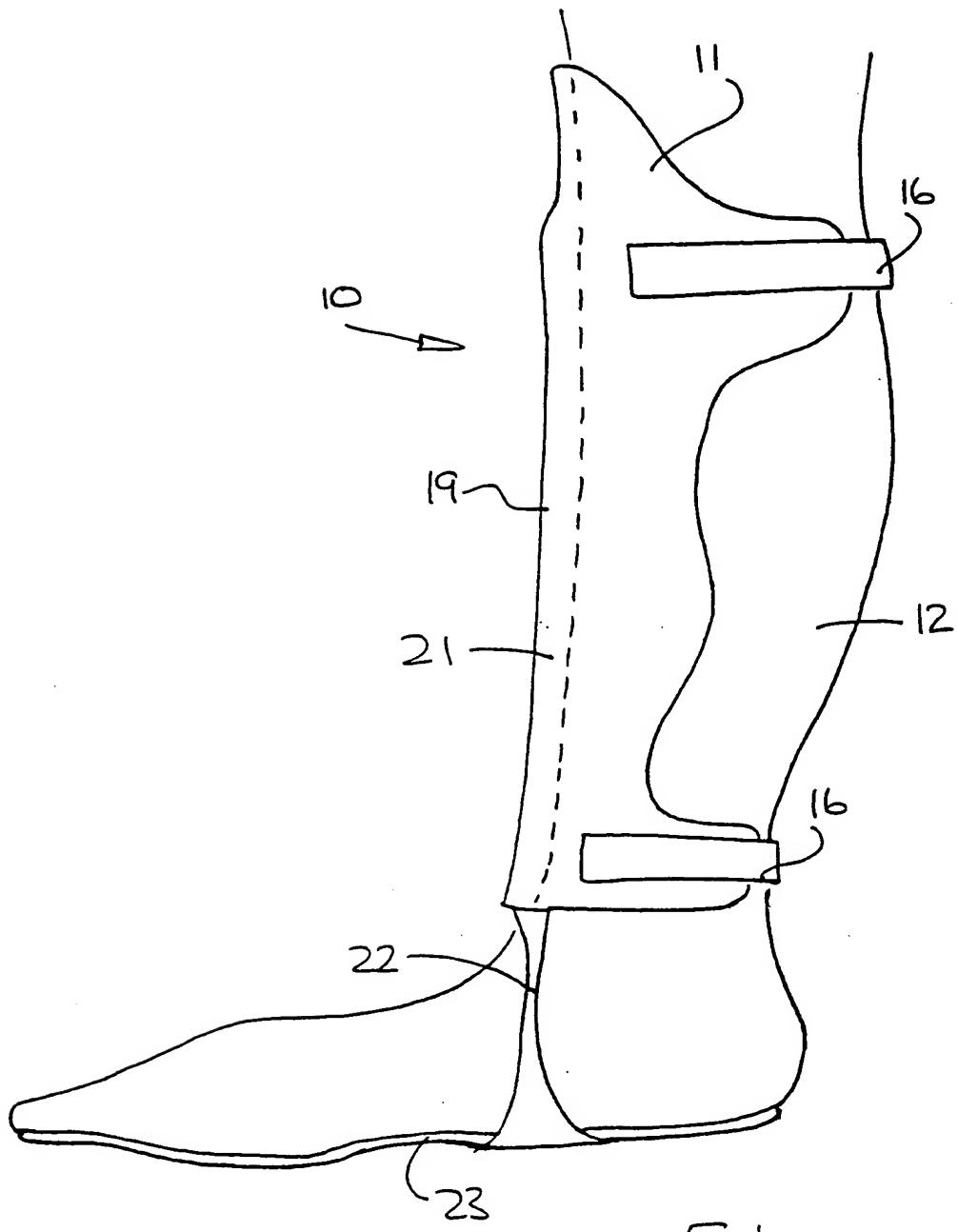
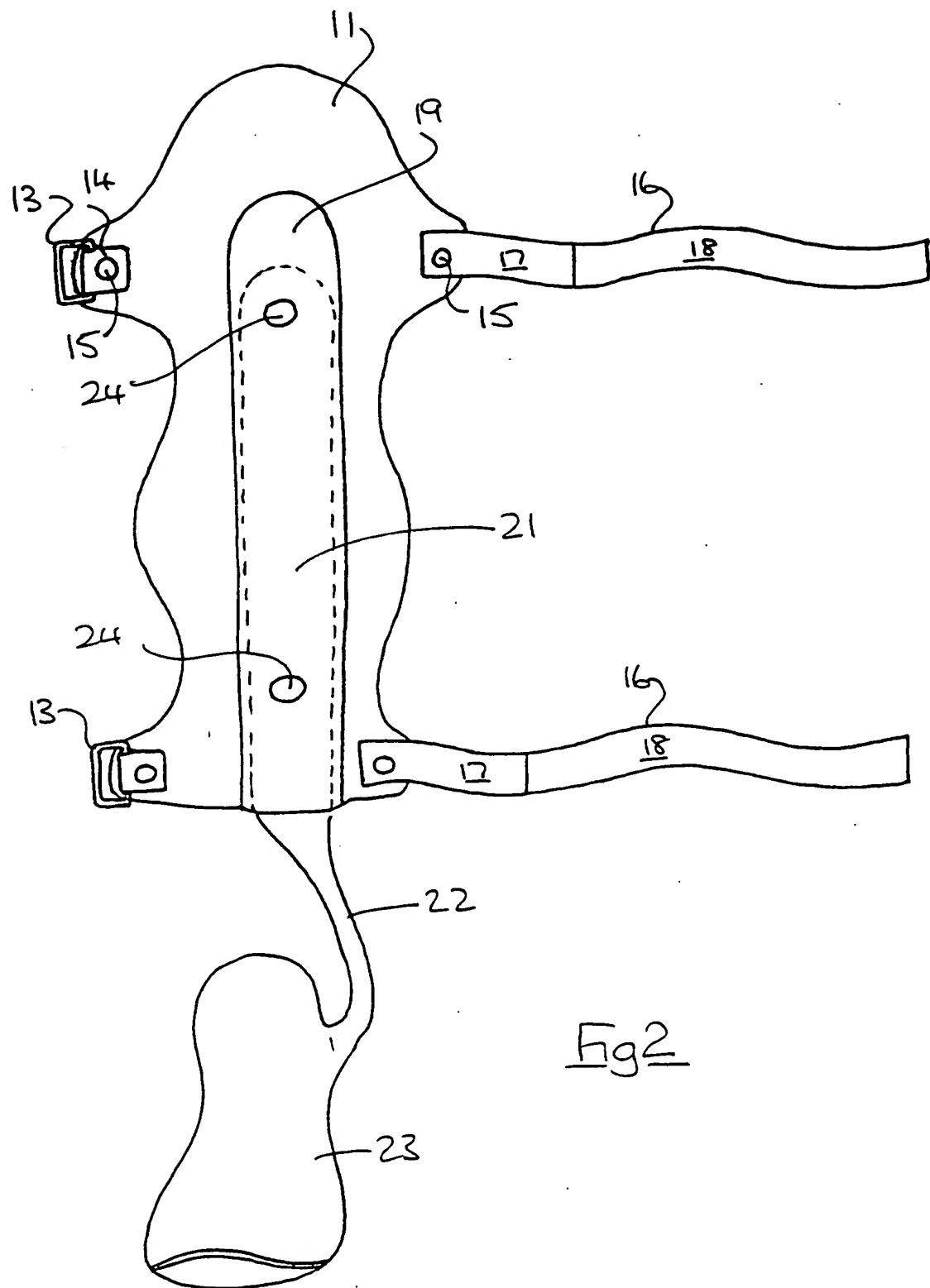


Fig 1



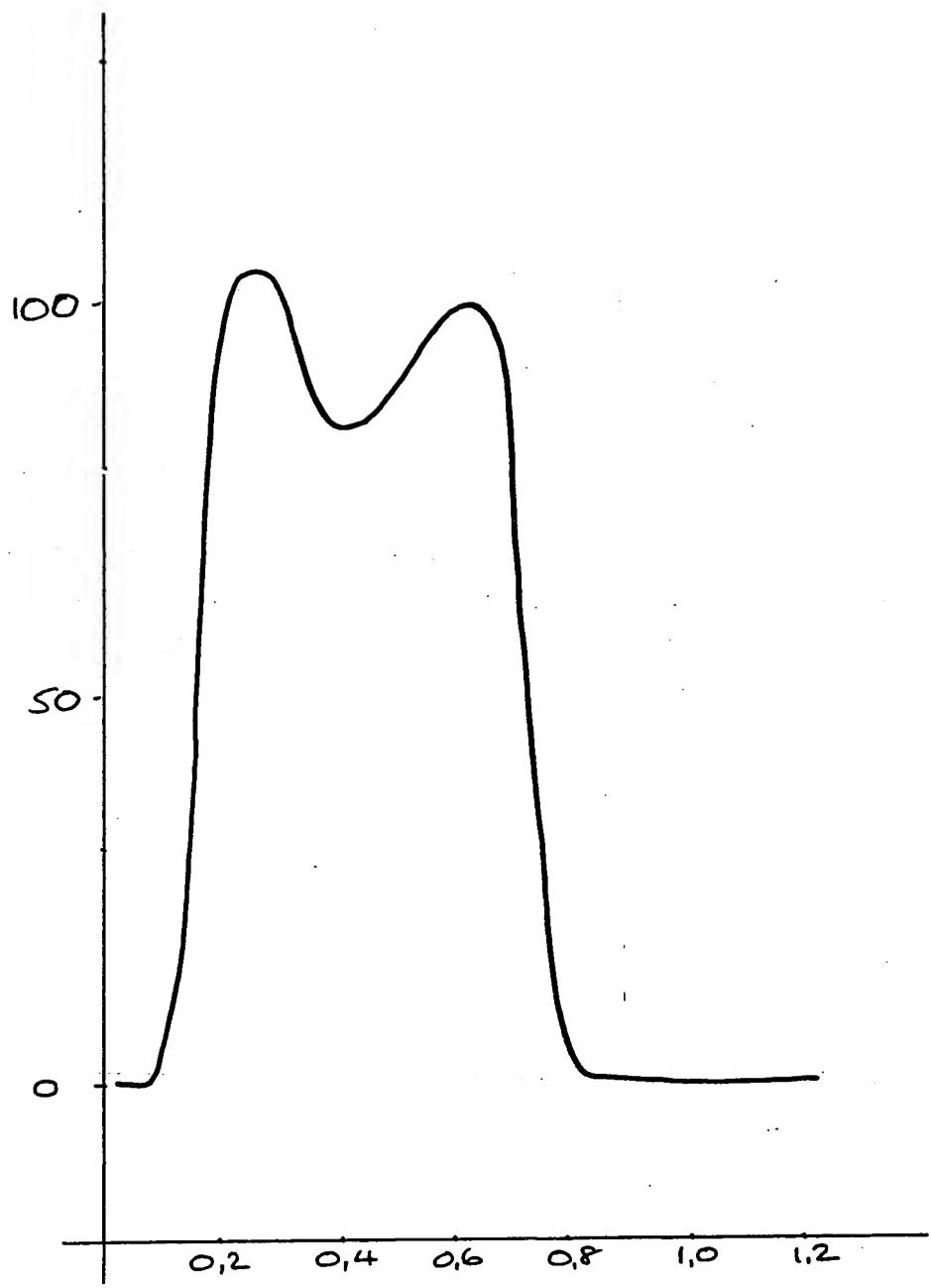


Fig 3

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